

Having thus, described the invention, what is claimed is:

1. A swash plate plunger type hydraulic unit comprising:

a cylinder which is rotatably supported and has a plurality of plunger holes extending in an axial direction and arranged in a loop to surround a rotation axis thereof;

a plurality of plungers slidably disposed in the respective plunger holes;

a swash plate to which outer end portions of the plungers are contacted;

a casing for supporting the swash plate in such a manner that it can tilt and roll with a rolling axis perpendicular to the rotation axis as a center, and housing the swash plate and the cylinder; and

a swash plate tilting angle detector detecting a tilting and rolling angle of the swash plate;

the swash plate tilting angle detector comprising an angle detector mounted to the casing and a rotation connection mechanism having one end which is situated coaxial to the rolling axis and connected to the swash plate and another end which is connected to the angle detector; and

the rotation connection mechanism accurately transmits the tilting and rolling angle of the swash plate to the angle detector even when a rotation axis of a portion of the angle detector connected to the rotation connection mechanism is inclined at an angle with respect to the rolling axis.

2. A swash plate type hydraulic unit of claim 1, wherein the rotation connection mechanism comprises a first connection rod which is connected to the swash plate coaxially to the rolling axis, a second connection rod connected to the rotation detector, and a movable joint connecting the first connection rod to the second connection rod.

3. A swash plate type hydraulic unit of claim 2, wherein the movable joint comprises a pin.

4. A swash plate type hydraulic unit of claim 2, wherein the movable joint comprises one of a universal joint and a pin.
5. A swash plate type hydraulic unit of claim 1, wherein the one end of the rotation connection mechanism is connected to the swash plate through a shaft securing member.
6. A swash plate type hydraulic unit of claim 1, further comprising a rolling member connected to the swash plate and through which the swash plate can tilt and roll with the rolling axis.
7. A swash plate type hydraulic unit of claim 6, wherein the one end of the rotation connection mechanism is connected to the rolling member.
8. A swash plate plunger type hydraulic unit comprising:
  - a cylinder which is rotatably supported and has a plurality of plunger holes extending in an axial direction and arranged in a loop to surround a rotation axis thereof;
  - a plurality of plungers slidably disposed in the respective plunger holes;
  - a swash plate to which outer end portions of the plungers are contacted;
  - a casing for supporting the swash plate in such a manner that it can tilt and roll with a rolling axis perpendicular to the rotation axis as a center, and housing the swash plate and the cylinder; and
  - a swash plate tilting angle detector detecting a tilting and rolling angle of the swash plate;
  - the swash plate tilting angle detector comprising an angle detector mounted to the casing and a rotation connection mechanism having one end which is situated coaxial to the rolling axis and connected to the swash plate and another end which is connected to the angle

detector; and

the rotation connection mechanism includes a first connection rod which is fixed to the swash plate coaxially to the rolling axis, and a second connection rod fixed to the rotation detector and movably connected to the first connection rod.

9. A swash plate type hydraulic unit of claim 8, wherein the first and second connection rods are movably connected such that the rotation connection mechanism accurately transmits the tilting and rolling angle of the swash plate to the angle detector even when a rotation axis of a portion of the angle detector connected to the rotation connection mechanism is inclined at an angle with respect to the rolling axis.

10. A swash plate type hydraulic unit of claim 8, wherein the first and second connection rods are movably connected through one of a universal joint and a pin.

11. A swash plate type hydraulic unit of claim 8, wherein the one end of the rotation connection mechanism is connected to the swash plate through a shaft securing member.

12. A swash plate type hydraulic unit of claim 8, further comprising a rolling member connected to the swash plate and through which the swash plate can tilt and roll with the rolling axis.

13. A swash plate type hydraulic unit of claim 12, wherein the one end of the rotation connection mechanism is connected to the rolling member.